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be traced towards τ *Herculis.* The southern border was far less distinct; it passed north of δ *Draconis*, of several stars of the 6th magnitude. Estimated length, about 44°.

"At 12^h, the northern border could be traced beyond η *Herculis;* the southern border still less distinct than the northern. In the vicinity of δ *Draconis* there seemed to be faint traces of a second tail. Whole length of tail, 60° to 65°; breadth, 7° to 8°.

"July 5, 11^h 30^m. Sky very fine. The tail could be traced nearly to τ *Herculis,* the northern boundary being still the better defined. The southern border scarcely reached δ *Draconis,* and passed over ι and κ *Böotis,* where there was again the faint beginning of a second tail, bending northwards, as on the night before. The tail did not reach τ *Herculis.* Length, about 45°; greatest breadth, 10°.

"July 8, 11^h 30^m. The evening in general not favourable. The comet considerably fainter than on July 5, but still a conspicuous object in the heavens. The centre of the tail pointed midway between ρ and χ *Herculis;* but it could not be traced up to those stars. The fan or second tail, which was observed on July 4 and 5, had entirely disappeared. Length, about 27°.

"July 9. General appearance nearly the same as on the preceding night. Length, about 20° to 24°.

"July 14. The comet considerably smaller. The head, which had been up to this time always estimated as of the 1st and 2d magnitude, was to-night decidedly not brighter than a star of the 3d magnitude. Both borders of the tail well defined, though the northern could be traced farther than the southern. Length of tail, 15° or 16°.

"July 16. The appearance very similar to that on July 14. Length, 12° or 13°."

Progress of the Charts in course of execution at Bonn.

Communicated by Mr. Carrington, as received from Dr. Krüger, by the direction of Dr. Argelander.

Seven sections, each comprising four sheets, are published. The first four sections were received several months since by the Observatories and Astronomers to whom they are presented. Sections 5, 6, and 7 were despatched, through Marcus of Bonn, at the end of last October; and vols. iii. and iv. of the *Bonn Observations,* being vols. i. and ii. of the present *Survey,* are about to follow. The charts comprising the Zone 2° S. to 20° N., and the next, 20° N. to 40° N., are fully published; and section 7, containing sheets 26, 27, 32, 33, will amount to half the next Zone, 40° to 60° N.

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The observations by zones of 2 and 3 degrees broad with the 34-lines telescope were brought to a close at 81° N. on March 27, 1859, and amount to 1841 zones. By means of auxiliary tables, the positions of all the stars of Bessel's zones, from +15° to +45° from Weisse's catalogue, Oeltzen's catalogue, &c. were brought up to 1855·0, and entered in the same ledgers (about 190 in number), which record the original entries of times of transit in the Bonn zones. In order to see by inspection that each star was twice observed, a special catalogue was transcribed, in which the positions were arranged in zones of one hour each, and one degree broad. When the two observations of each star had been thus compared, the next step was the reduction to 1855 of all the stars contained in the former Catalogues of Lalande, Bessel, Argelander, Piazzi, Groombridge, Johnson, Rümker, Fedorenko, Schwerd, Struve (*Pos. Med.*), &c.; and the entering of the results alongside of those of the *Bonn Survey;* when, if the different authorities exhibited marked discrepancies, a further research was instituted. All cases of discrepancy were put aside, and entered in books for further examination or reobservation where the source of error was not easily detected.

The re-examination of the still dubious cases has been, for the most part, the special labour of Dr. Argelander himself, and a very laborious and important part of the undertaking, the necessary observations on the meridian having engaged his whole time from 1854 to 1860.

It has further been found necessary to repeat the survey in portions of the heavens unusually rich in stars, or where the previous ordinary survey had been taken during moonshine. For this purpose 476 additional Revision-Zones have been observed with a 5-foot telescope, by taking 1° only at a time in breadth, and on an average a much less extent in right ascension than those of the first survey.

In addition to the revision of doubtful stars, Professor Argelander has completely observed all stars to the 8th magnitude the positions whereof were found to be previously undetermined. The results of these observations will be embodied in a separate catalogue of about 30,000 stars observed with the meridian circle. The revision-observations of this class have been long in progress, so that the number of still undetermined stars is reduced to about 1000, and the whole is likely to be finished next summer. The reduction of these observations is somewhat in arrear, and a year or more may be required before the catalogue can be formed.

Dr. Krüger proceeds to remark, that after the correction of all known errors, the next step was the preparation of the principal catalogue, the arrangement of which he describes, but which can be seen by inspection of the work itself. He points out that the fourth volume contains a catalogue of all the errors detected at Bonn in the zones of Bessel, from −2°

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to +45° decl., and states that the result of the revision appears to be, that, excepting two cases of observations of planets, the whole of the observations of Bessel agree with positions of stars which still exist. He remarks that the result affords a weighty argument against those who hastily speak of vanished stars, and that the stability of the heavens has received so strong a support that suppositions of sudden change will in future be received with the greatest mistrust.

The preparation of the principal catalogue was assigned to Prof. Schonfeld, who has continued to forward the work since his removal to Mannheim; so that now the manuscript is complete.

The preceding account relates to north declination to 81°. It was considered impossible to continue the observations in zones beyond this point, on account of the extremely slow movement of the stars, and recourse was had to the first issue of Mr. Carrington's Charts (those printed by the anastatic process), which were compared anew with the heavens by means of a large comet-seeker, the magnitudes noted, and wanting stars supplied—the last by use of the heliometer.

To complete this work there now remains only the plotting out of certain charts, and the printing by lithography; and only three sheets besides the polar chart are incomplete. The rest are partly finished, partly in the press, and partly in MSS.

The catalogue progresses simultaneously, and the third section is in the press. When this is done, there will follow the special catalogue of 30,000 stars observed on the meridian, and the correction of errors in the Histoire Celeste, Argelander's Northern Zones, and other catalogues.

The Fellows of the Society, and all to whom this account comes, cannot fail to admire the stately progress of this enormous work, which, simple in its conception, and free from insurmountable difficulties in execution, would appal many an astronomer by its vast extent.

The President communicated a letter from Mr. Basil Henry Cooper, "On the Egyptian Phœnix Period of 540 years, spoken of in a passage of Pliny." The letter partly relates to an eclipse of the Moon, recorded in a hieroglyphical inscription at Karnak, which the author concludes to have been that of the night of the 16 March, B.C. 851.

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The President communicated observations by Mr. S. Horton of Encke's Comet, and of the planet *Saturn*, extracted from the Hartwell Observatory Register. The comet was seen:—

	1861, Nov. 24.	Nov. 26.	Nov. 30.
Right Ascension	$22^h\ 31^m$	$22^h\ 29^m$	$22^h\ 25^m$
Declination	$7^\circ\ 53'$	$7^\circ\ 29'$	$6^\circ\ 49'$
Hour Angle	$2^h\ 13^m$	4^h	2^h
Clock	$0^h\ 45^m$	$2^h\ 31^m$	$0^h\ 26^m$

Power 22 and 5c.

Among the presents to the Society was included a volume of 111 Indian-ink drawings, by Mr. S. Gorton, of the planet *Jupiter*, radius about one inch, from observations made at Downs Road, Clapton, in the years 1859–60–61. The author remarks that as the observations were taken for the purpose of recording any great or marked changes in the principal belts, with an instrument of moderate size, the representation of those minute details for which great power was necessary was not attempted. The earlier drawings were made under some disadvantages—the telescope being used at a window, and not having an equatoreal mounting; this was added in April 1860, after which the planet was observed more regularly.

The power used was almost invariably 100; the telescope by Ross, 4 feet focal length, $3\frac{3}{8}$ inches aperture.

An Account of Observations on Solar Radiation.

By John James Waterston, Esq.

§ 1. In March of last year I submitted to the Society some computations with reference to the Sun's heat, and suggesting a mode of deducing the potential temperature of its radiating surface. This last summer I have endeavoured to put this method to the proof by a series of observations on solar radiation, supplemented with experiments on the rate of cooling of thermometers in air and in vacuo with different kinds of radiating surfaces; also by another series applying the method of deducing the potential temperature of a radiating surface to predicate the temperature of one that is maintained at a constant *known* temperature.

The success of these last mentioned, so far as they have as yet been carried, encourages me to lay before the Society the observations on solar radiation, with an account of the method